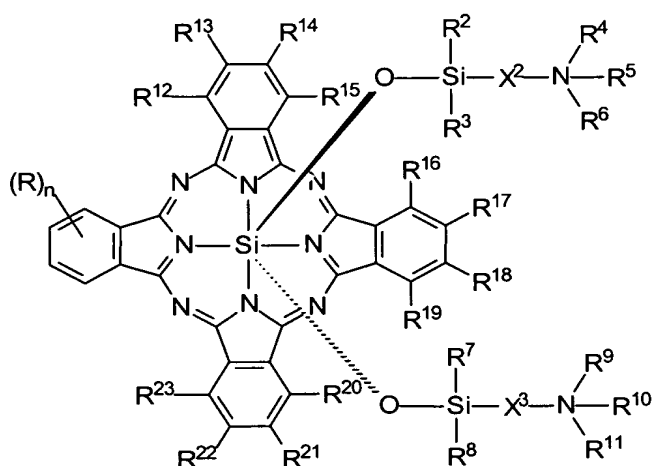


## WHAT IS CLAIMED IS:

1. A phthalocyanine dye comprising a luminescent fluorophore moiety having at least one silicon containing an aqueous-solubilizing moiety, wherein said phthalocyanine dye has a core atom selected from the group consisting of Si, Ge, Sn, and Al; wherein said phthalocyanine dye exists as a single core isomer, essentially free of other isomers; and has a reactive or activatable group.

2. The phthalocyanine dye of claim 1, wherein said core atom is Si.

3. The phthalocyanine dye of claim 2, wherein said dye has Formula I:



I

wherein:

R is a member selected from the group consisting of -L-Q and -L-Z<sup>1</sup>;

L is a member selected from the group consisting of a direct link, or a covalent linkage, wherein said covalent linkage is linear or branched, cyclic or heterocyclic, saturated or unsaturated, having 1-60 atoms selected from the group consisting of C, N, P, O, and S, wherein L can have additional hydrogen atoms to fill valences, and wherein said linkage contains any combination of ether, thioether, amine, ester, carbamate, urea, thiourea, oxy or amide bonds; or single, double, triple or aromatic carbon-carbon bonds; or phosphorus-oxygen, phosphorus-sulfur, nitrogen-nitrogen, nitrogen-oxygen, or nitrogen-platinum bonds; or aromatic or heteroaromatic bonds;

Q is a reactive or an activatable group;

Z<sup>1</sup> is a material;

n is 1 or 2;

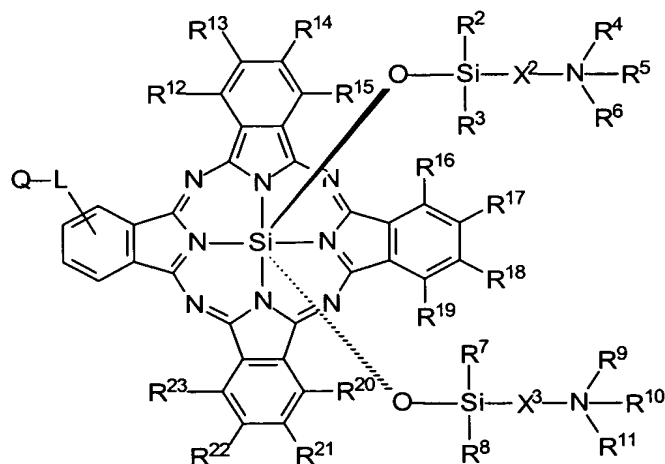
$R^2$ ,  $R^3$ ,  $R^7$ , and  $R^8$  are each independently selected from optionally substituted alkyl, and optionally substituted aryl;

$R^4$ ,  $R^5$ ,  $R^6$ ,  $R^9$ ,  $R^{10}$ , and  $R^{11}$ , if present, are each members independently selected from the group consisting of hydrogen, optionally substituted alkyl, optionally substituted alkanoyl, optionally substituted alkoxy carbonyl, optionally substituted alkyl carbamoyl, and a chelating ligand, wherein at least one of  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^9$ ,  $R^{10}$ , and  $R^{11}$  comprises a water soluble group;

$R^{12}$ ,  $R^{13}$ ,  $R^{14}$ ,  $R^{15}$ ,  $R^{16}$ ,  $R^{17}$ ,  $R^{18}$ ,  $R^{19}$ ,  $R^{20}$ ,  $R^{21}$ ,  $R^{22}$  and  $R^{23}$  are each members independently selected from the group consisting of hydrogen, halogen, optionally substituted alkylthio, optionally substituted alkylamino and optionally substituted alkoxy, or in an alternative embodiment, at least one of i)  $R^{13}$ ,  $R^{14}$ , and the carbons to which they are attached, or ii)  $R^{17}$ ,  $R^{18}$ , and the carbons to which they are attached, or iii)  $R^{21}$ ,  $R^{22}$  and the carbons to which they are attached, join to form a fused benzene ring; and

$X^2$  and  $X^3$  are each members independently selected from the group consisting of  $C_1$ - $C_{10}$  alkylene optionally interrupted by a heteroatom, wherein if n is 1, the phthalocyanine may be substituted either at the 1 or 2 position and if n is 2, each R may be the same or different, or alternatively, they may join to form a 5- or 6-membered ring.

4. The phthalocyanine dye of claim 3, wherein said dye has Formula Ia:



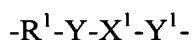
**Ia**

wherein:  $R^2$ ,  $R^3$ ,  $R^7$ , and  $R^8$  are each independently selected from optionally substituted alkyl, and optionally substituted aryl;

6  $R^4, R^5, R^6, R^9, R^{10}$ , and  $R^{11}$ , if present, are each members independently  
7 selected from the group consisting of hydrogen, optionally substituted alkyl, optionally  
8 substituted alkanoyl, optionally substituted alkoxy carbonyl, optionally substituted  
9 alkylcarbamoyl, wherein at least one of  $R^4, R^5, R^6, R^9, R^{10}$ , and  $R^{11}$  comprises a water soluble  
10 group; and

11  $R^{12}, R^{13}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19}, R^{20}, R^{21}, R^{22}$  and  $R^{23}$  are each members  
12 independently selected from the group consisting of hydrogen, halogen, optionally substituted  
13 alkylthio, optionally substituted alkylamino and optionally substituted alkoxy, or in an  
14 alternative embodiment, at least one of i)  $R^{13}, R^{14}$ , and the carbons to which they are attached,  
15 or ii)  $R^{17}, R^{18}$ , and the carbons to which they are attached, or iii)  $R^{21}, R^{22}$  and the carbons to  
16 which they are attached, join to form a fused benzene ring.

1 5. The phthalocyanine dye of claim 4, wherein L is of the formula



3 wherein

4  $R^1$  is a bivalent radical or a direct link;

5 Y and  $Y^1$  are each independently selected from the group consisting of a direct  
6 link, oxygen, an optionally substituted nitrogen and sulfur;

7  $X^1$  is a member selected from the group consisting of a direct link and  $C_1-C_{10}$   
8 alkylene optionally interrupted by a heteroatom;

1 6. The phthalocyanine dye of claim 5, wherein  $R^1$  is a bivalent radical  
2 selected from the group consisting of optionally substituted alkylene, optionally substituted  
3 alkyleneoxycarbonyl, optionally substituted alkylencarbamoyl, optionally substituted  
4 alkylenesulfonyl, optionally substituted alkylenesulfonylcarbamoyl, optionally substituted  
5 arylene, optionally substituted arylenesulfonyl, optionally substituted aryleneoxycarbonyl,  
6 optionally substituted arylencarbamoyl, optionally substituted arylenesulfonylcarbamoyl,  
7 optionally substituted carboxyalkyl, optionally substituted carbamoyl, optionally substituted  
8 carbonyl, optionally substituted heteroarylene, optionally substituted  
9 heteroaryleneoxycarbonyl, optionally substituted heteroarylenecarbamoyl, optionally  
10 substituted heteroarylenesulfonylcarbamoyl, optionally substituted sulfonylcarbamoyl,  
11 optionally substituted thiocarbonyl, a optionally substituted sulfonyl, and optionally  
12 substituted sulfinyl.

1                   7.       The phthalocyanine dye of claim 5, wherein  $R^2$ ,  $R^3$ ,  $R^7$ , and  $R^8$  are  
2 each independently selected from optionally substituted alkyl, and optionally substituted aryl,  
3                    $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^9$ ,  $R^{10}$ , and  $R^{11}$ , if present, are each members independently  
4 selected from an optionally substituted alkyl, wherein at least two members of the group  
5 consisting of  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$ , and  $R^9$  comprise a water soluble functional group;

6                    $R^{12}$ ,  $R^{13}$ ,  $R^{14}$ ,  $R^{15}$ ,  $R^{16}$ ,  $R^{17}$ ,  $R^{18}$ ,  $R^{19}$ ,  $R^{20}$ ,  $R^{21}$ ,  $R^{22}$  and  $R^{23}$  are each hydrogen,  
7 halogen, optionally substituted alkylthio, optionally substituted alkylamino and optionally  
8 substituted alkoxy, or in an alternative embodiment, at least one of  $R^{13}$ ,  $R^{14}$ , and the carbons  
9 to which they are attached, or  $R^{17}$ ,  $R^{18}$ , and the carbons to which they are attached, or  $R^{21}$ ,  $R^{22}$   
10 and the carbons to which they are attached, join to form a fused benzene ring;

11                    $X^1$ ,  $X^2$  and  $X^3$  are each members independently selected from the group  
12 consisting of  $C_1$ - $C_{10}$  alkylene optionally interrupted by a heteroatom; and

13                   Y and  $Y^1$  are each independently selected from the group consisting of a direct  
14 link, oxygen, an optionally substituted nitrogen and sulfur.

1                   8.       The phthalocyanine dye of claim 7, wherein  $R^2$ ,  $R^3$ ,  $R^7$ , and  $R^8$  are  
2 each independently selected from optionally substituted methyl, ethyl, and isopropyl;

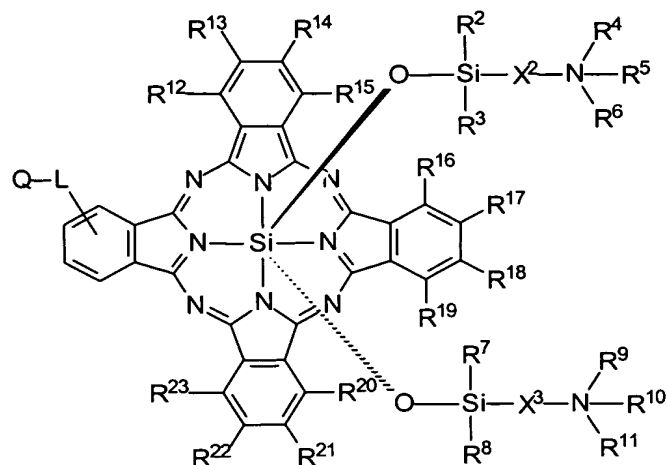
3                    $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^9$ ,  $R^{10}$ , and  $R^{11}$ , if present, are each members independently  
4 selected from an optionally substituted alkyl, wherein at least two members of the group  
5 consisting of  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$ , and  $R^9$  comprise a substituent selected from the group  
6 consisting of a carboxylate ( $-CO_2^-$ ) group, a sulfonate ( $-SO_3^-$ ) group, a sulfonyl ( $-SO_2^-$ ) group,  
7 a sulfate ( $-SO_4^{-2}$ ) group, a hydroxyl ( $-OH$ ) group, a phosphate ( $-OPO_3^{-2}$ ) group, a  
8 phosphonate ( $-PO_3^{-2}$ ) group, an amine ( $-NH_2$ ) group and an optionally substituted quaternized  
9 nitrogen with each having an optional counter ion;

10                    $R^{12}$ ,  $R^{13}$ ,  $R^{14}$ ,  $R^{15}$ ,  $R^{16}$ ,  $R^{17}$ ,  $R^{18}$ ,  $R^{19}$ ,  $R^{20}$ ,  $R^{21}$ ,  $R^{22}$  and  $R^{23}$  are each hydrogen;

11                    $X^1$ ,  $X^2$  and  $X^3$  are each members independently selected from the group  
12 consisting of  $C_1$ - $C_{10}$  alkylene optionally interrupted by a heteroatom; and

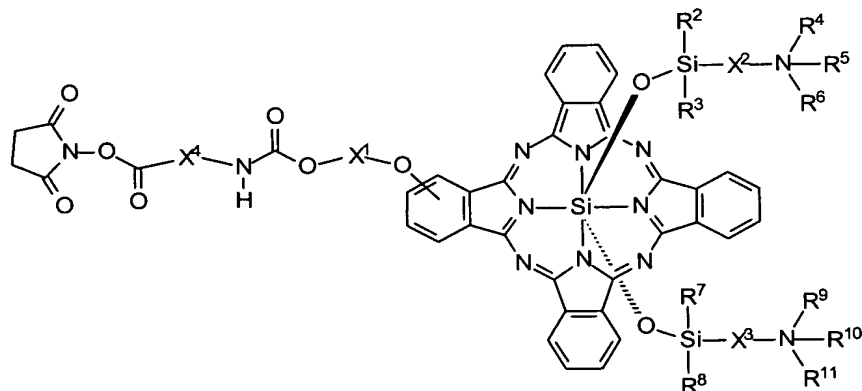
13                   Y and  $Y^1$  are each independently selected from the group consisting of a direct  
14 link, oxygen, an optionally substituted nitrogen and sulfur.

1                   9.       The phthalocyanine dye claim 3, wherein said dye has the formula:



wherein Q is a reactive or an activatable group selected from the group consisting of an alcohol, an activated ester, an acyl halide, an alkyl halide, an optionally substituted amine, an anhydride, a carboxylic acid, a carbodiimide, hydroxyl, iodoacetamide, an isocyanate, an isothiocyanate, a maleimide, an NHS ester, a phosphoramidite, a platinum complex, a sulfonate ester, a thiol, and a thiocyanate.

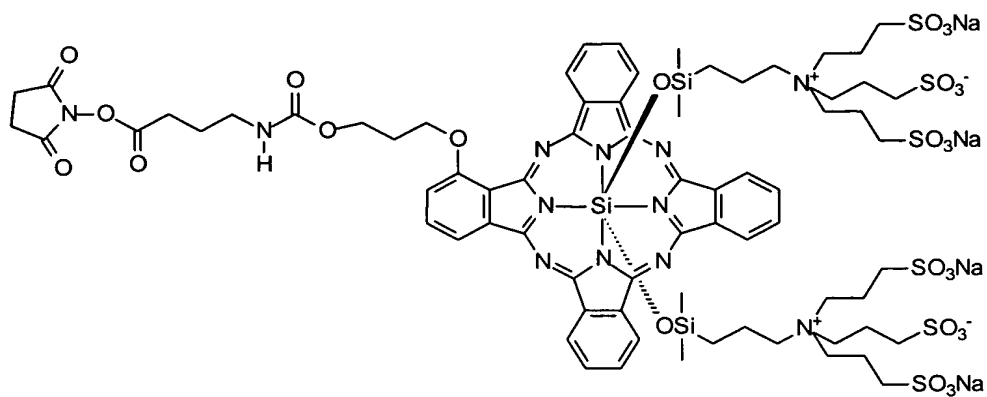
10. The phthalocyanine dye of claim 9, wherein said compound has the formula:



**Ib**

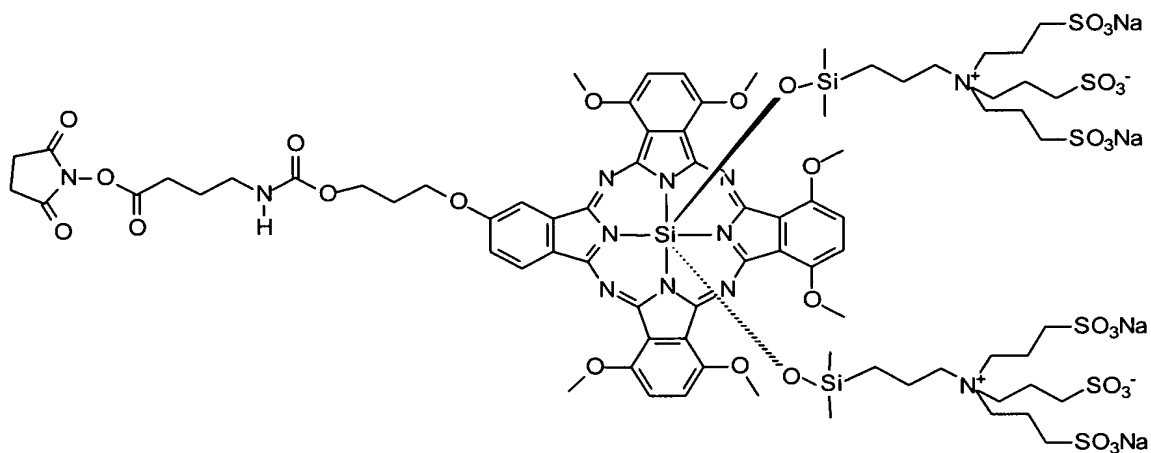
wherein X<sup>4</sup> is a C<sub>1</sub>-C<sub>10</sub> alkylene optionally interrupted by a heteroatom.

11. The phthalocyanine dye of claim 10, wherein said compound has the formula:



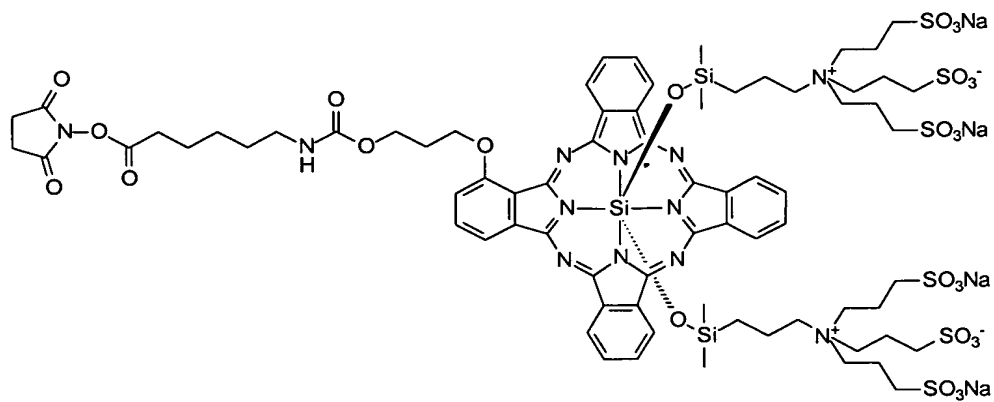
**Ic**

12. The phthalocyanine dye of claim 3, wherein said compound has the formula:



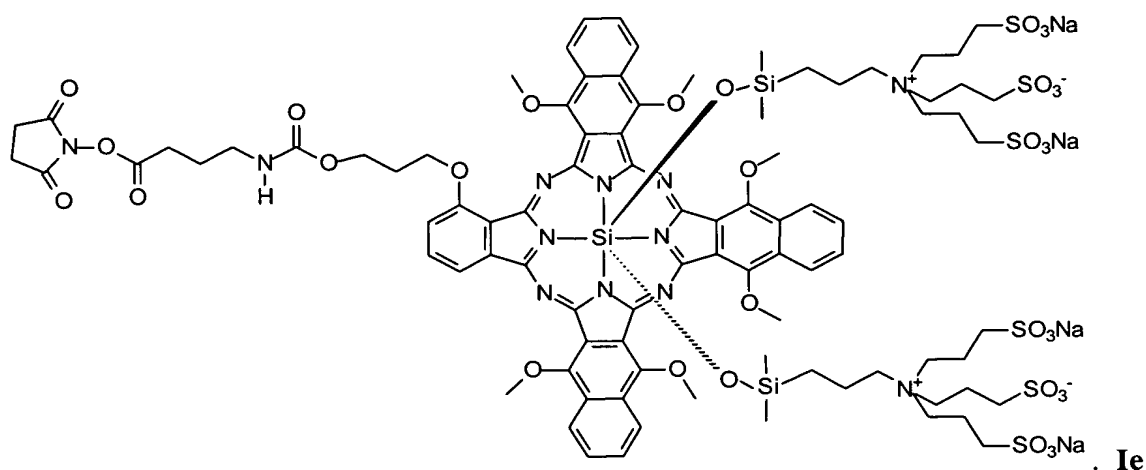
**Id**

13. The phthalocyanine dye of claim 3, wherein said compound has the formula:

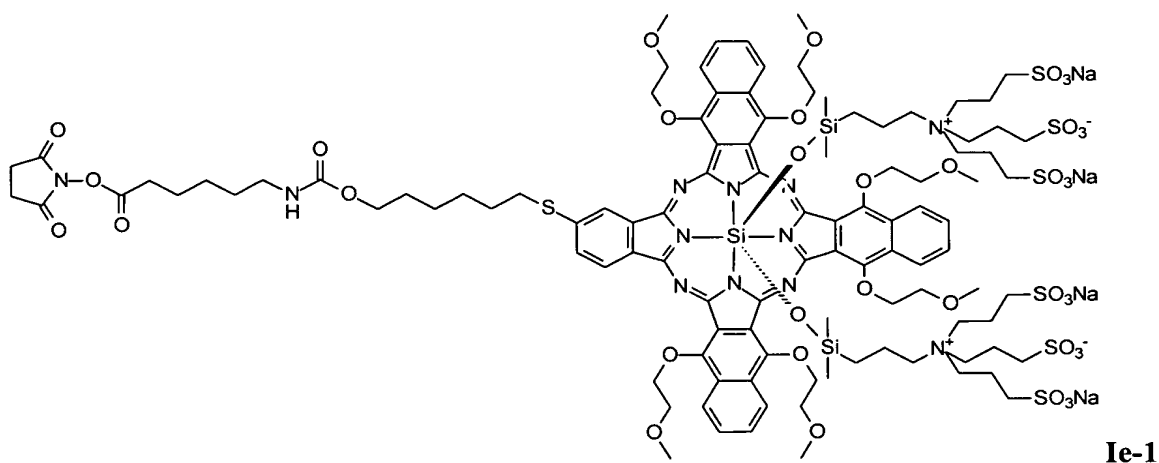


**Id-1**

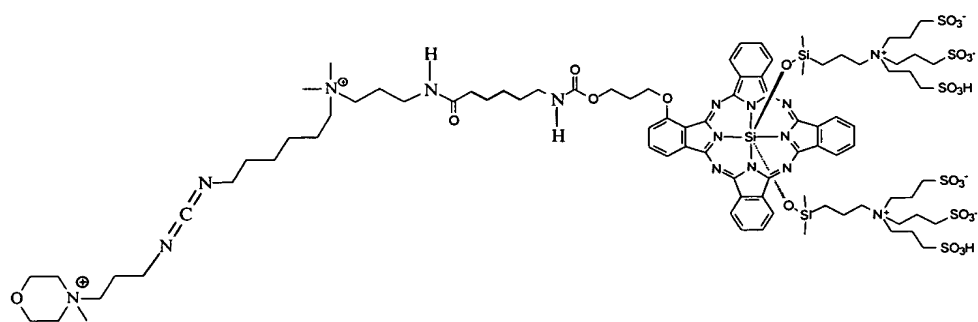
1                    14.    The phthalocyanine dye of claim 3, wherein said compound has the  
2 formula:



1                    15.    The phthalocyanine dye of claim 3, wherein said compound has the  
2 formula:



1                    16.    The phthalocyanine dye of claim 3, wherein said compound has the  
2 formula:





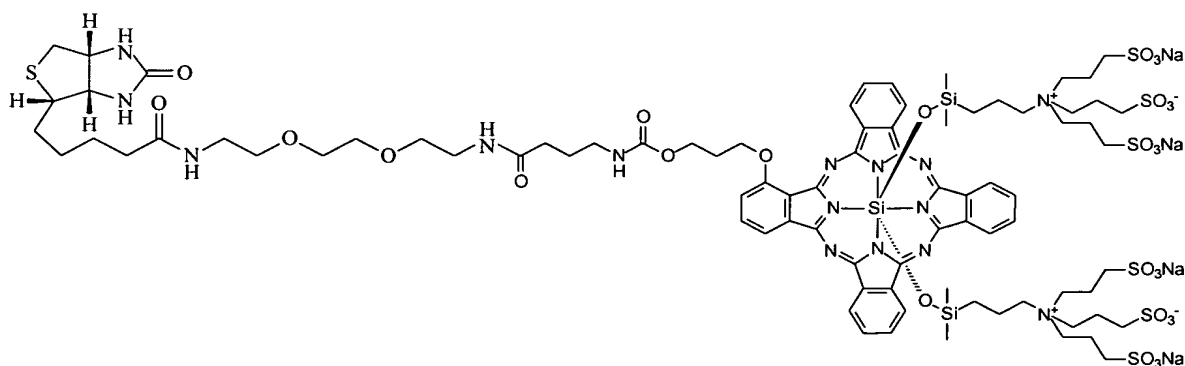




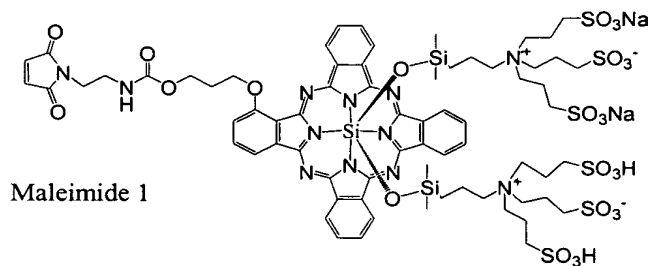
optionally substituted arylencarbamoyl, optionally substituted arylenesulfonylcarbamoyl, optionally substituted carboxyalkyl, optionally substituted carbamoyl, optionally substituted carbonyl, optionally substituted heteroarylene, optionally substituted heteroaryleneoxycarbonyl, optionally substituted heteroarylenecarbamoyl, optionally substituted heteroarylenesulfonylcarbamoyl, optionally substituted sulfonylcarbamoyl, optionally substituted thiocarbonyl, a optionally substituted sulfonyl, and optionally substituted sulfinyl.

**20.** The phthalocyanine dye of claim 18, wherein said biomolecule is a member selected from the group consisting of a small molecule, a marker, a cell, a liposome, a protein, a peptide, an enzyme substrate, a hormone, an antibody, an antigen, a hapten, an avidin, a streptavidin, biotin, a carbohydrate, an oligosaccharide, a polysaccharide, a nucleic acid, a deoxy nucleic acid, a fragment of DNA, a fragment of RNA, nucleotide triphosphates, acyclo terminator triphosphates, and PNA.

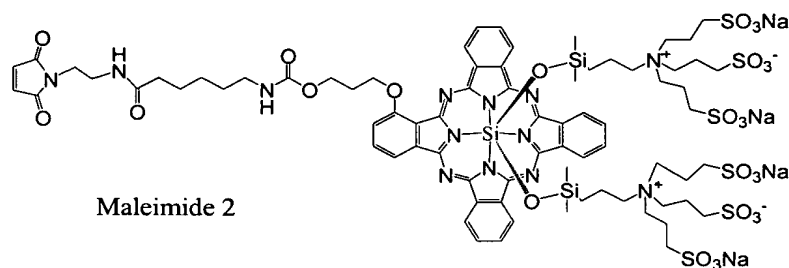
**21.** The phthalocyanine dye of claim **20**, wherein said phthalocyanine dye has the formula:



**22.** The phthalocyanine dye of claim **20**, wherein said phthalocyanine dye has the formula:

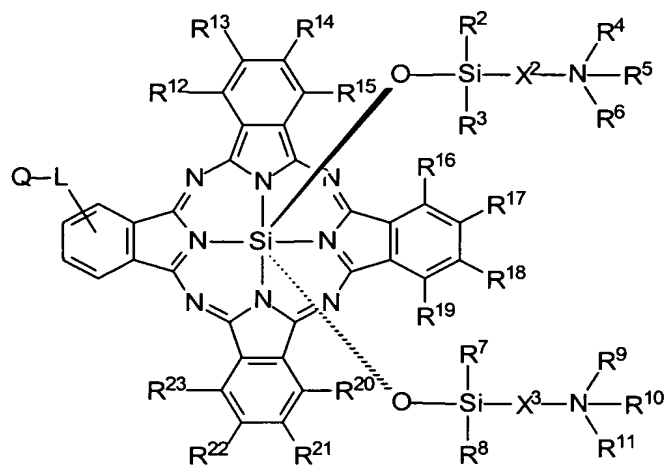


23. The phthalocyanine dye of claim 20, wherein said phthalocyanine dye has the formula:



24. The phthalocyanine dye of claim 18, wherein the covalent linkage between L-R<sup>1</sup> is selected from the group consisting of a direct bond, an amide bond, an ester bond, an ether bond, an oxime bond, a phosphate ester bond, a sulfonamide bond, a thioether bond, a thiourea bond, and an urea bond.

25. A process for making a dye-labeled biomolecule, said method comprising:  
contacting a biomolecule and an optional activating reagent with a compound having the formula:



**Ib**

wherein:

L is a member selected from the group consisting of a direct link, or a covalent linkage, wherein said covalent linkage is linear or branched, cyclic or heterocyclic, saturated or unsaturated, having 1-60 atoms selected from the group consisting of C, N, P, O, and S, wherein L can have additional hydrogen atoms to fill valences, wherein said linkage contains any combination of ether, thioether, amine, ester, carbamate, urea, thiourea, oxy or amide

bonds; or single, double, triple or aromatic carbon-carbon bonds; or phosphorus-oxygen, phosphorus-sulfur, nitrogen-nitrogen, nitrogen-oxygen, or nitrogen-platinum bonds; or aromatic or heteroaromatic bonds;

Q is a reactive or an activatable group;

$R^2$ ,  $R^3$ ,  $R^7$ , and  $R^8$  are each independently selected from optionally substituted alkyl, and optionally substituted aryl;

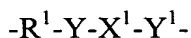
$R^4$ ,  $R^5$ ,  $R^6$ ,  $R^9$ ,  $R^{10}$ , and  $R^{11}$ , if present, are each members independently selected from the group consisting of hydrogen, optionally substituted alkyl, optionally substituted alkanoyl, optionally substituted alkoxy carbonyl, optionally substituted alkylcarbamoyl, and a chelating ligand wherein at least one of  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^9$ ,  $R^{10}$ , and  $R^{11}$  comprises a water soluble group;

$R^{12}$ ,  $R^{13}$ ,  $R^{14}$ ,  $R^{15}$ ,  $R^{16}$ ,  $R^{17}$ ,  $R^{18}$ ,  $R^{19}$ ,  $R^{20}$ ,  $R^{21}$ ,  $R^{22}$  and  $R^{23}$  are each members independently selected from the group consisting of hydrogen, halogen, optionally substituted alkylthio, optionally substituted alkylamino and optionally substituted alkoxy, or in an alternative embodiment, at least one of i)  $R^{13}$ ,  $R^{14}$ , and the carbons to which they are attached, or ii)  $R^{17}$ ,  $R^{18}$ , and the carbons to which they are attached, or iii)  $R^{21}$ ,  $R^{22}$  and the carbons to which they are attached, join to form a fused benzene ring; and

$X^2$  and  $X^3$  are each members independently selected from the group consisting of  $C_1$ - $C_{10}$  alkylene optionally interrupted by a heteroatom, for sufficient time, thereby making a dye-labeled biomolecule.

**26.** The process of claim **25**, wherein Q is a reactive or an activatable group selected from the group consisting of an alcohol, an activated ester, an acyl halide, an alkyl halide, an optionally substituted amine, an anhydride, a carboxylic acid, a carbodiimide, hydroxyl, iodoacetamide, an isocyanate, an isothiocyanate, a maleimide, an NHS ester, a phosphoramidite, a sulfonate ester, a thiol, and a thiocyanate.

**27.** The process of claim **25**, wherein L is of the formula:



wherein

$R^1$  is a bivalent radical or a direct link;

Y and  $Y^1$  are each independently selected from the group consisting of a direct link, oxygen, an optionally substituted nitrogen and sulfur;

$X^1$  is a member selected from the group consisting of a direct link and  $C_1-C_{10}$  alkylene optionally interrupted by a heteroatom;

$R^2$ ,  $R^3$ ,  $R^7$ , and  $R^8$  are each independently selected from optionally substituted alkyl, and optionally substituted aryl;

$R^4$ ,  $R^5$ ,  $R^6$ ,  $R^9$ ,  $R^{10}$ , and  $R^{11}$ , if present, are each members independently selected from the group consisting of hydrogen, optionally substituted alkyl, optionally substituted alkanoyl, optionally substituted alkoxy carbonyl, optionally substituted alkyl carbamoyl, and a chelating ligand, wherein at least two of  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^9$ ,  $R^{10}$ , and  $R^{11}$  comprises a water soluble group; and

$R^{12}$ ,  $R^{13}$ ,  $R^{14}$ ,  $R^{15}$ ,  $R^{16}$ ,  $R^{17}$ ,  $R^{18}$ ,  $R^{19}$ ,  $R^{20}$ ,  $R^{21}$ ,  $R^{22}$  and  $R^{23}$  are each members independently selected from the group consisting of hydrogen, halogen, optionally substituted alkylthio, optionally substituted alkylamino and optionally substituted alkoxy, or in an alternative embodiment, at least one of i)  $R^{13}$ ,  $R^{14}$ , and the carbons to which they are attached, or ii)  $R^{17}$ ,  $R^{18}$ , and the carbons to which they are attached, or iii)  $R^{21}$ ,  $R^{22}$  and the carbons to which they are attached, join to form a fused benzene ring.

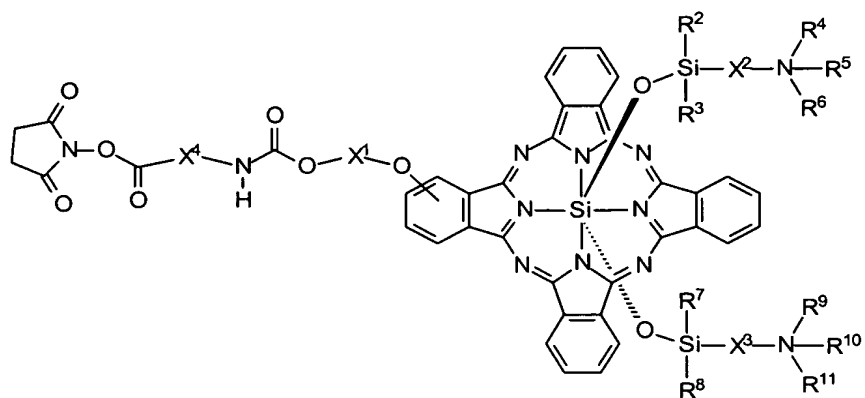
**28.** The process of claim **25**, wherein  $R^1$  is a bivalent radical selected from the group consisting of optionally substituted alkylene, optionally substituted alkyleneoxycarbonyl, optionally substituted alkylene carbamoyl, optionally substituted alkylene sulfonyl, optionally substituted alkylene sulfonyl carbamoyl, optionally substituted arylene, optionally substituted arylene sulfonyl, optionally substituted aryleneoxycarbonyl, optionally substituted arylene carbamoyl, optionally substituted arylene sulfonyl carbamoyl, optionally substituted carboxyalkyl, optionally substituted carbamoyl, optionally substituted carbonyl, optionally substituted heteroarylene, optionally substituted heteroaryleneoxycarbonyl, optionally substituted heteroarylene carbamoyl, optionally substituted heteroarylene sulfonyl carbamoyl, optionally substituted sulfonyl carbamoyl, optionally substituted thiocarbonyl, a optionally substituted sulfonyl, and optionally substituted sulfinyl.

**29.** The process of claim **25**, wherein  $R^2$ ,  $R^3$ ,  $R^7$ , and  $R^8$  are each independently selected from optionally substituted alkyl, and optionally substituted aryl;  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^9$ ,  $R^{10}$ , and  $R^{11}$ , if present, are each members independently selected from an optionally substituted alkyl, wherein at least two members of the group consisting of  $R^4$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$ , and  $R^9$  comprise a water soluble functional group;

$R^{12}, R^{13}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19}, R^{20}, R^{21}, R^{22}$  and  $R^{23}$  are each hydrogen, halogen, optionally substituted alkylthio, optionally substituted alkylamino and optionally substituted alkoxy, or in an alternative embodiment, at least one of  $R^{13}, R^{14}$ , and the carbons to which they are attached, or  $R^{17}, R^{18}$ , and the carbons to which they are attached, or  $R^{21}, R^{22}$  and the carbons to which they are attached, join to form a fused benzene ring;  
 $X^1, X^2$  and  $X^3$  are each members independently selected from the group consisting of  $C_1$ - $C_{10}$  alkylene optionally interrupted by a heteroatom; and  
 $Y$  and  $Y^1$  are each independently selected from the group consisting of a direct link, oxygen, an optionally substituted nitrogen and sulfur;

**30.** The process of claim **25**, wherein  $R^2, R^3, R^7$ , and  $R^8$  are each independently selected from optionally substituted methyl, ethyl, and isopropyl;  
 $R^4, R^5, R^6, R^9, R^{10}$ , and  $R^{11}$ , if present, are each members independently selected from an optionally substituted alkyl, wherein at least two members of the group consisting of  $R^4, R^5, R^6, R^7, R^8$ , and  $R^9$  comprise a substituent selected from the group consisting of a carboxylate ( $-CO_2^-$ ) group, a sulfonate ( $-SO_3^-$ ) group, a sulfonyl ( $-SO_2^-$ ) group, a sulfate ( $-SO_4^{-2}$ ) group, a hydroxyl ( $-OH$ ) group, a phosphate ( $-OPO_3^{-2}$ ) group, a phosphonate ( $-PO_3^{-2}$ ) group, an amine ( $-NH_2$ ) group and an optionally substituted quaternized nitrogen with each having an optional counter ion;  
 $R^{12}, R^{13}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19}, R^{20}, R^{21}, R^{22}$  and  $R^{23}$  are each hydrogen;  
 $X^1, X^2$  and  $X^3$  are each members independently selected from the group consisting of  $C_1$ - $C_{10}$  alkylene optionally interrupted by a heteroatom; and  
 $Y$  and  $Y^1$  are each independently selected from the group consisting of a direct link, oxygen, an optionally substituted nitrogen and sulfur;

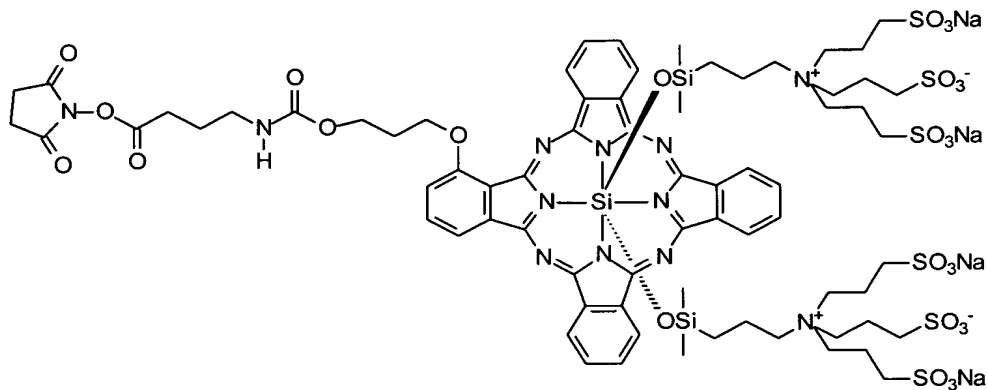
**31.** The process of claim **25**, wherein said compound has the formula:



**Ic**

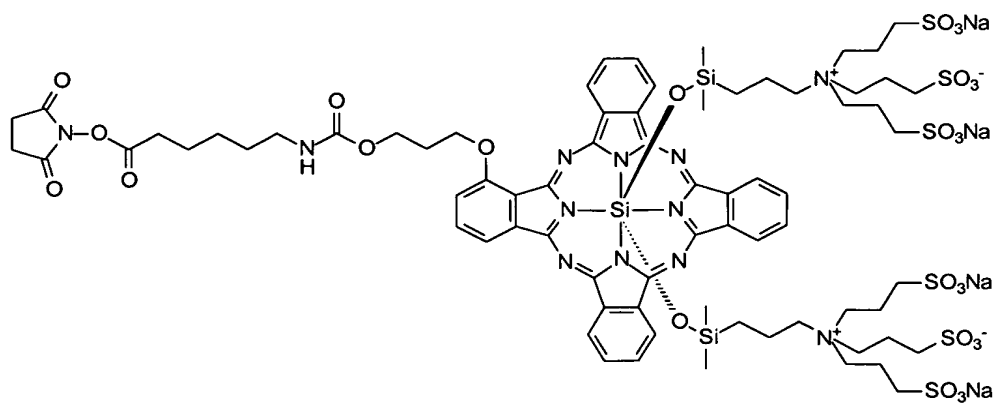
wherein  $X^4$  is a  $C_1$ - $C_{10}$  alkylene optionally interrupted by a heteroatom.

**32.** The process of claim 25, wherein said compound has the formula:



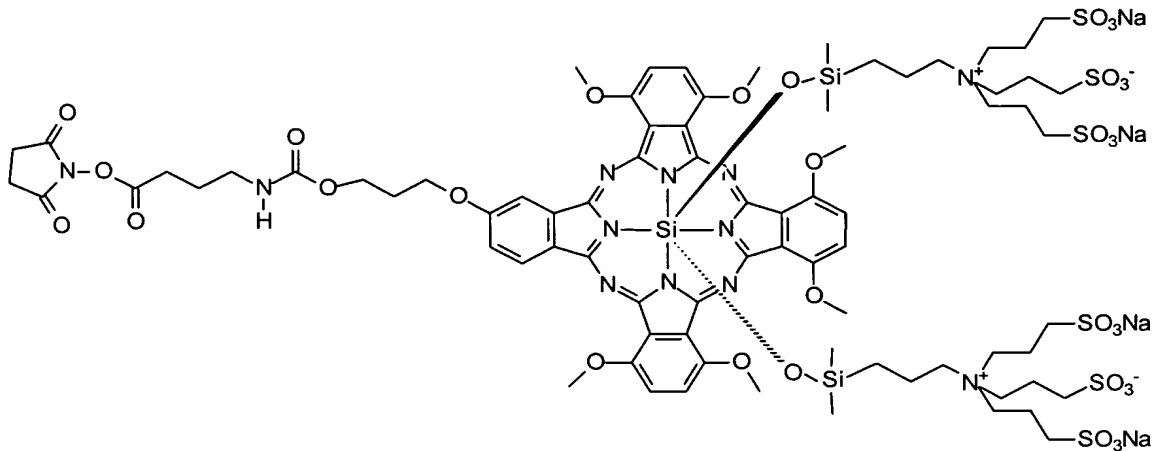
**Id**

**33.** The process of claim 25, wherein said compound has the formula:

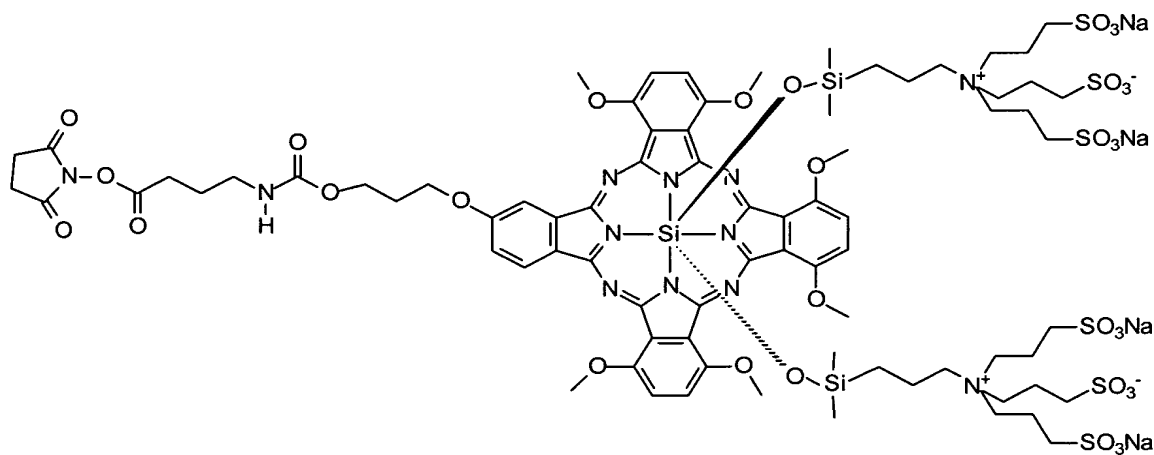


**Id-1**

1            34        The process of claim 25, wherein said compound has the formula:

**Ie**

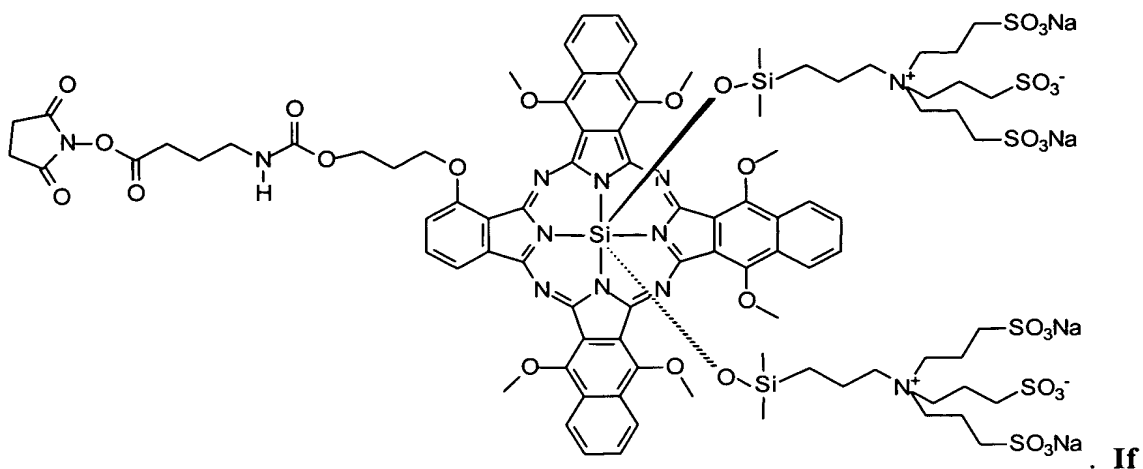
1           **35.** The process of claim **25**, wherein said compound has the formula:



**Ie-1**

1            **36.**     The process of claim **25**, wherein said compound has the formula:





2

1

2

3

1

**37.** A kit for labeling a biomolecule, said kit comprising:  
a compound according to claim 1; and  
instructions for use.

**38** The kit of claim 37, wherein said kit further comprises a buffer.